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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/628,085

07/24/2003

Dennice F. Gayme

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EXAMINER

MANCHO, RONNIE M

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/628,085	Applicant(s) GAYME ET AL.	
	Examiner Ronnie Mancho	Art Unit 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-7,9-12,14-21,25,28-31,33,34 and 36-38 is/are pending in the application.
4a) Of the above claim(s) 12,14-21,25 and 28-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5-7,9-11,31,33,34 and 36-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. The applicant again repeats the very statements why the restriction by the office is traversed. The examiner notes that applicant's traversal to the restriction has been addressed and the response will no longer be repeated here.

The applicant further argues that the examiner has shown no burden why the restriction should be held proper. It noted that burden is disclosed in MPEP 808.02.

2. Applicant's asserts that the rejection of 11/27/06 are the exact rejection applied to the nonelected claims, and as such the restriction should be withdrawn. The examiner notes that the rejection is not exact rejection as urged by the applicant because applicant had amended the claims. It is further noted that there is no rule that precludes the issuing of a restriction after all the claims have been rejected. As already pointed out the claims have acquired separate status in the art as indicated by the different patentably distinct embodiments disclosed in applicant's specification and drawings. Instead of the applicant arguing that the inventions are related, applicant needs to either state that the inventions are patentably distinct or that they are Not patentably distinct as required by MPEP.

The requirement is still deemed proper and is therefore made FINAL.

Specification

The disclosure is objected to because of the following informalities: In the amended specification,

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3. The amendment filed 2/27/07 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The applicant in section 0024 changed "residual difference" to ~~--difference--~~. Then in section 0027, the applicant changed "residual difference" ~~--residual--~~. This is new matter.

In the previous office action, the examiner advised the applicant to make certain changes to the specification. It is noted that it was done in error. Applicant is hereby advised not make the changes suggested in the last office action to avoid new matter. Any inconvenience to the applicant is regretted..

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 5-7, 9-11, 31, 33, 34, 36-38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

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In amended claim 11, the applicant recites, “a selected maximum safe exhaust gas temperature for the turbine engine”. This is new matter.

In claim 31, “a computing processor” is new matter because applicant added an extra processor to the claimed apparatus. There is no support for a second processor.

The rest of the claims are rejected for depending on a rejected base claim or for having the rejected deficiency.

6. Claims 1, 5-7, 9-11, 31, 33, 34, 36-38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In claim 1, the applicant recites “residuals”. In defining the term residuals, applicant’s page 5, lines 4 and 5 recite” Generating *residuals can be accomplished* using a variety of techniques such as by comparing the sensor data to expected values and determining the *residual difference*”. The definition is not clear because one skilled in the art will not able to ascertain and make the invention in view of applicant’s conflicting claimed, “residual” compared to the disclosed, “residual difference” in the specification.

Applicant further recites, “determining a rate of change of residuals”. How and in what manner is “rate of change” determined, what criteria is used?

Applicant further recites, “selected”. How and in what manner is “selected” done, what are the criteria used?

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In claims 11 and 38, the applicant further recites, “augment the sensor data by determining a margin”. How and in what manner is “a margin” related to “augment the sensor data”?

The above rejected limitations have just been copied from the specification and pasted in the claims.

The rest of the claims are rejected for depending on a rejected base claim or for having the rejected deficiency.

7. As presently set forth, the computer components (i.e., sensor data processor, computing processor, fuzzy logic inference system, etc.) are essentially a black box with no description of the internals thereof. The disclosure is thus insufficient in failing to set forth in an adequate and sufficient fashion, a description of the internals of the components which would enable the device to perform all of the features (i.e., calculations, etc.) that are disclosed and claimed. If applicant is of the opinion that there is a description in the prior art (in the form of literature, etc. having a date prior to the filing date of this application), of the internals of the components that can accomplish the disclosed and claimed features (i.e., calculations, etc.), copies of said literature, etc., must be submitted for appropriate review by the Office. See *In re Ghiron et al*, 169 USPQ 723, 727.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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9. Claims 1, 5-7, 9-11, 31, 33, 34, 36-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. In claims 1 and 31, the applicant recites “likelihood”. The term is a relative term and is thus indefinite. Applicant recites the term in the specification providing no particular meaning thereof. Applicant just copies the term from the specification and pasted it in the claims. The applicant further recites, “data type”. The phrase is indefinite since applicant does not show that there are plural or different types of data sensed.

In claims 11 and 34 the limitation, “a maximum safe temperature” is indefinite. The phrase, “maximum” is a relative term. How and in what manner is “maximum” or “safe” determined. Applicant does not provide a threshold by which the above terms are determined.

In claim 31, the applicant recites “a computing processor” and “a sensor data processor”. There is no distinction between the both processors in the claim.

The rest of the claims are rejected for depending on a rejected base claim.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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12. Claims 1, 5-7, 9, 10, 11, 31, 33, 34, 36-38 are rejected under 35 U.S.C. 102(e) as being anticipated by McBrien et al (2003/0139860).

Regarding claim 1, McBrien et al (abstract, figs. 1, 3-7; pages 2-5) disclose a fault detection system for detecting faults in a turbine engine, the fault detection system comprising:

a sensor data processor (14, 16; sec. 0050), the sensor data processor configured to receive sensor data (see QS, NP, NR, etc; sec. 0050, 0051) from the turbine engine and augment (data is filtered, conditioned, compared to thresholds, etc) the sensor data to provide an augmented data set, wherein the sensor data processor (14, 16) is configured to augment the sensor data by generating residuals (the filtered or conditioned data, etc are residuals; sec. 0050, 0051) from the sensor data and determining a rate of change of the residuals (horse power deviation rate. Note that the horse power is computed from the augmented i.e. conditioned sensor data; sec. 0051-0057. The horse power rate of change for each sensor is provided respectively in the equations in sec. 0057); and

a fuzzy logic inference system 30, the fuzzy logic inference system configured to receive the augmented data set (the data from units 14, 16 passed through units 18, 20 and then to the fuzzy logic system 30; fig. 3), and wherein the fuzzy logic inference system 30 includes a plurality of membership functions, and wherein each of the plurality of membership functions is associated with at least one data type in the augmented data set, and wherein the fuzzy logic system is configured to fuzzify the augmented data set using the plurality of membership functions and analyze the augmented data set to determine a likelihood that a fault has occurred in the turbine engine (abstract; sec. 0048, 0066-0068; when the ratio is above a or below a

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given number, it is determined that there is a likely hood or probability that a fault is in the engine).

Regarding claim 5, McBrien et al (abstract, figs. 1, 3-7; pages 2-5) disclose the system of claim 1 wherein the sensor data processor is configured to augment the sensor data by computing a margin (reference value, sec. 0051) for the sensor data.

Regarding claim 6, McBrien et al (abstract, figs. 1, 3-7; pages 2-5) disclose the system of claim 1 wherein the sensor data comprises engine speed data, fuel flow data and exhaust gas temperature data (sec. 0051-0054).

Regarding claim 7, McBrien et al (abstract, figs. 1, 3-7; pages 2-5) disclose the system of claim 1, wherein the sensor data processor is configured to receive exhaust gas temperature data and wherein the sensor data processor is configured to augment the exhaust gas temperature data by determining exhaust gas temperature margin data corresponding to a difference between the exhaust gas temperature data and a maximum safe temperature.

Regarding claim 9, McBrien et al (abstract, figs. 1, 3-7; pages 2-5) disclose the system of claim 1 wherein the fuzzy logic inference system includes a plurality of rules, and wherein the fuzzy logic system is configured to evaluate the fuzzified augmented data set according to the plurality of rules.

Regarding claim 10, McBrien et al (abstract, figs. 1, 3-7; pages 2-5) disclose the system of claim 9 wherein the fuzzy logic inference system is further configured to aggregate outputs of the plurality of rules and defuzzifies the aggregated output for input into a diagnostic system.

Regarding claim 11, McBrien et al (abstract, figs. 1, 3-7; pages 2-5) disclose the system of claim 10 wherein the aircraft system comprises a turbine engine and the sensor data.exhaust

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gas temperature data, engine speed data, and fuel flow data (sec. 0051-0054), and wherein the sensor data processor is configured to augment the sensor data by generating residuals from the exhaust gas temperature data, engine speed data and fuel flow data (sec. 0051-0054), and wherein the sensor data processor is configured to further augment the sensor data by determining a rate of change of the residuals (see claim 1), and wherein the sensor data processor is configured further to augment the sensor data by determining a margin (reference value, sec. 0051) for the exhaust temperature data corresponding to a difference between the exhaust gas temperature data and a selected maximum safe exhaust gas temperature for the turbine engine.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claim 31, 33, 34, 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over McBrien et al (20030139860) in view of Martucci et al (6289274).

Regarding claim 31, McBrien et al (abstract, figs. 1, 3-7; pages 2-5) disclose an apparatus comprising:

[due to the 112 rejection of claim 31, "a computing processor" will be interpreted as --a processor--, and "a sensor data processor" will be interpreted as --a sensor data processing program--. See applicant's specification, sec 0066 last line and fig. 12]

a processor (14, 16; sec. 0050);

McBrien et al disclose programs, but does not disclose a memory storing the programs. However, Martucci et al teach of a memory coupled to a processor, wherein the memory comprises a fault detection program residing in the memory and being executed by a processor (14; col. 4, lines 60 to col. 5, line2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify McBrien for the purpose of storing executable fuzzy programs on a memory;

therefore, McBrien as modified by Matucci et al disclose the fault detection program including:

a sensor data processing program (sec. 0050-0054), the sensor data processing program configured to receive sensor data (see QS, NP, NR, etc; sec. 0050, 0051) from the turbine engine and augment (data is filtered, conditioned, compared to thresholds, etc) the sensor data to provide an augmented data set, wherein the sensor data processing program is configured to augment the sensor data by generating residuals (the filtered or conditioned data, etc are residuals; sec. 0050, 0051) from the sensor data and determining a rate of change of the residuals (horse power deviation rate. Note that the horse power is computed from the augmented i.e. conditioned sensor data; sec. 0051-0057. The horse power rate of change for each sensor is provided respectively in the equations in sec. 0057); and

a fuzzy logic inference system 30, the fuzzy logic inference system configured to receive the augmented data set (the data from units 14, 16 passed through units 18, 20 and then to the fuzzy logic system 30; fig. 3), and wherein the fuzzy logic inference system 30 includes a plurality of membership functions, and wherein each of the plurality of membership functions is associated with at least one data type in the augmented data set, and wherein the fuzzy logic

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system is configured to fuzzify the augmented data set using the plurality of membership functions and analyze the augmented data set to determine a likelihood that a fault has occurred (abstract; sec. 0048, 0066-0068; when the ration is above a or below a given number, it is determined that there is a likely hood or probability that a fault is in the engine).

Regarding claim 33, McBrien et al (abstract, figs. 1, 3-7; pages 2-5) disclose the apparatus of claim 31 wherein the sensor data comprises engine speed data, fuel flow data and exhaust gas temperature data (sec. 0050-0054).

Regarding claim 34, McBrien et al (abstract, figs. 1, 3-7; pages 2-5) disclose the apparatus of claim 31 wherein the sensor data processing program is configured to receive exhaust gas temperature data and wherein the sensor data processing program is further configured to augment the exhaust gas temperature data by determining exhaust gas temperature margin data corresponding to a difference between the exhaust gas temperature data and a selected maximum safe exhaust gas temperature for the turbine engine.

[due to the 112 rejection of claim 34, "a computing processor" will be interpreted as --a processor--, and "a sensor data processor" will be interpreted as --a sensor data processing program--. See applicant's specification, sec 0066 last line and fig. 12]

Regarding claim 36, McBrien et al (abstract, figs. 1, 3-7; pages 2-5) disclose the apparatus of claim 31 wherein the fuzzy logic inference system includes a plurality of rules, and wherein the logic system is configured to evaluate the fuzzified augmented data set according to the plurality of rules.

Regarding claim 37, McBrien et al (abstract, figs. 1, 3-7; pages 2-5) disclose the apparatus of claim 36 wherein the fuzzy logic inference system is configured to further aggregate

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outputs of the plurality of rules and defuzzify the aggregated output for input into a diagnostic system.

Regarding claims 38 McBrien et al (abstract, figs. 1, 3-7; pages 2-5) disclose the apparatus of claim 31, wherein the sensor data comprising exhaust gas temperature data, engine speed data, and fuel flow data, and wherein the sensor data processing program is configured to augment the sensor data by generating residuals from the exhaust gas temperature data, engine speed data, and fuel flow data (sec. 0050-0054), and wherein the sensor data processing program is configured to further augment the sensor data by determining a rate of change of the residuals (see claim 31), and wherein the sensor data processing program is configured to further augment the sensor data by determining a margin for the exhaust gas temperature data corresponding to a difference between the exhaust gas temperature data and a selected maximum safe exhaust gas temperature for the turbine engine.

[due to the 112 rejection of claim 38, “a computing processor” will be interpreted as --a processor--, and “a sensor data processor” will be interpreted as --a sensor data processing program--. See applicant’s specification, sec 0066 last line and fig. 12]

Response to Arguments

15. Applicant's arguments with respect to claims 1, 5-7, 9, 10, 11, 31, 33, 34, 36-38 have been considered but are moot in view of the new ground(s) of rejection.

Communication

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ronnie Mancho whose telephone number is 571-272-6984. The examiner can normally be reached on Mon-Thurs: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ronnie Mancho
Examiner
Art Unit 3663

5/24/07


JACK KEITH
SUPERVISORY PATENT EXAMINER